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Global CLIMATE
CHANGE

CLEAN POWER: STATUS, CHALLENGES, AND POLICY OPTIONS

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Pew Center on Global Climate Change

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- ❑ Founded in May 1998
- ❑ Independent, non-profit, non-partisan
- ❑ Produces **research** on policy, economics, science & impacts, and solutions
- ❑ Works with **policymakers** at state, federal, and international levels
- ❑ Conducts **education** and outreach
- ❑ Engages the **business** community through the Business Environmental Leadership Council (BELC)

Benefits of Clean Power

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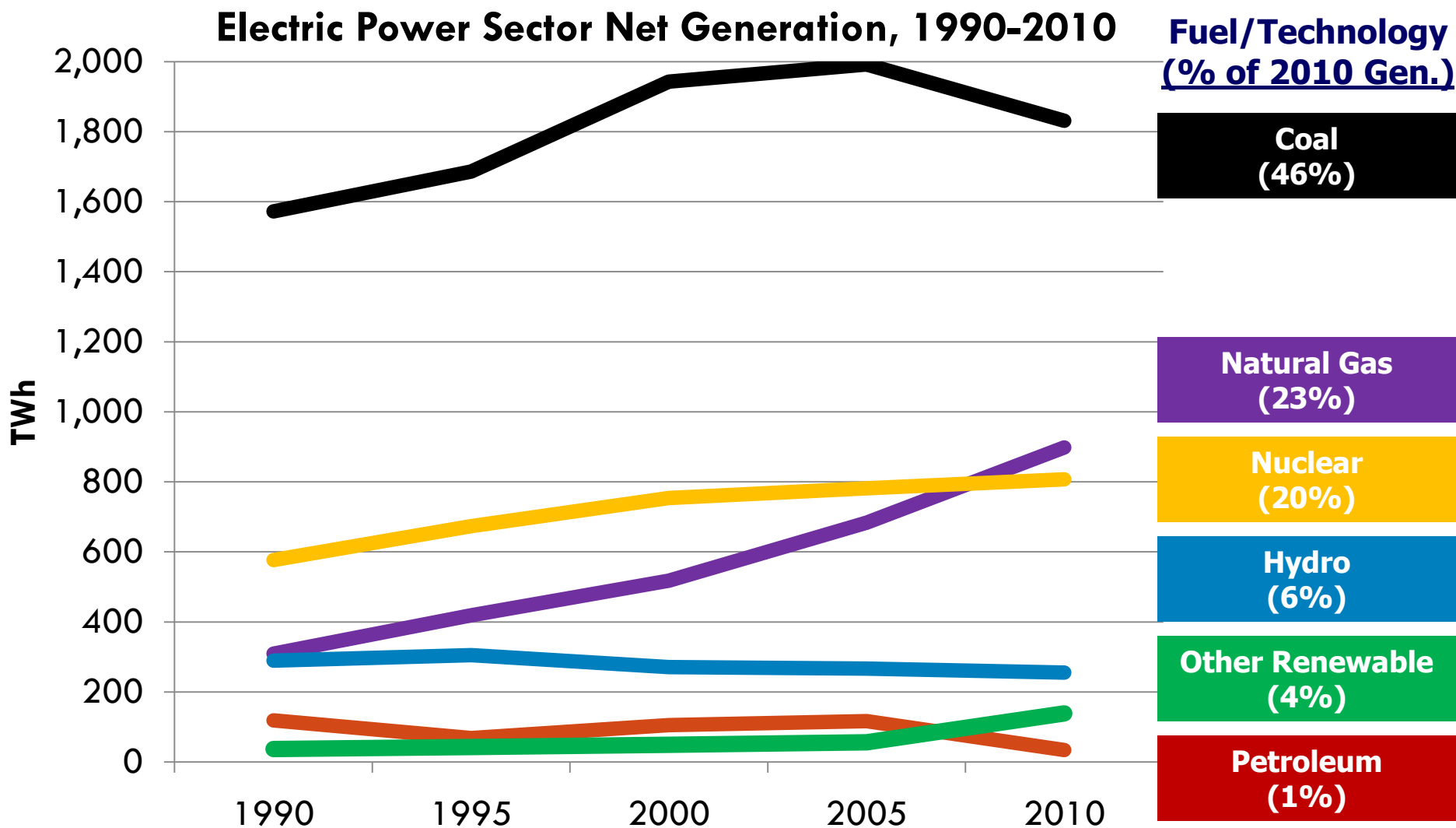
- ❑ New clean energy industries and jobs
- ❑ Public health and the environment
 - ❑ Greenhouse gas emissions and climate change
 - ❑ Other air emissions, water use, etc.
- ❑ Diversification of energy supply
- ❑ Energy security (clean power for electric vehicles)

Generally, the above benefits are now unpriced.



Status of Clean Power

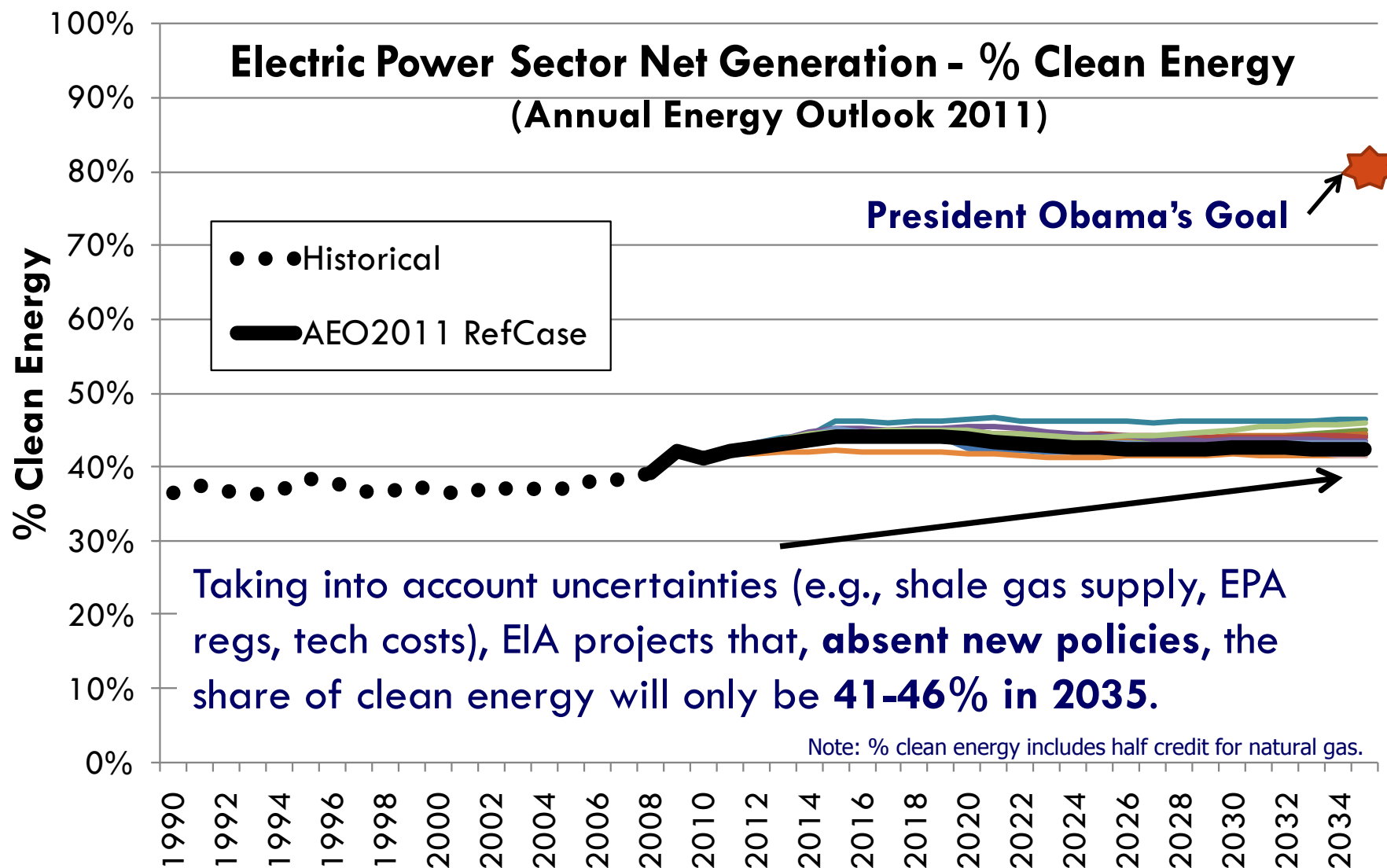
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“Business as Usual” Outlook

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Clean Power Options and Challenges

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The benefits of clean power are now unpriced, and clean power faces other challenges:

Renewables

- Cost, variability, transmission, siting

Nuclear

- Financing first-movers, spent fuel management, safety

Natural Gas

- Fracking concerns, lifecycle emissions

Fossil Fuel + CCS

- Cost, commercial-scale demos, CO₂ storage regulation

Energy Efficiency

- Utility incentives, information

How a CES Works

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- ❑ Electric utilities must meet a % of their “base quantity” of sales from qualified clean energy
- ❑ Compliance demonstrated via tradable credits
 - ❑ 1 clean energy credit (CEC) earned for 1 MWh of qualified clean energy generation
 - ❑ CECs are unbundled from electricity sales
- ❑ Utilities can earn, buy, and sell CECs
- ❑ CEC market price provides a financial incentive for deployment of clean energy technology

CES Design Choices and Principles

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Policy Design Choices

- ❑ Covered entities
- ❑ Qualified clean energy
- ❑ Targets and timetable
- ❑ Treatment of existing clean energy facilities
- ❑ Compliance flexibility
- ❑ Interaction with state programs

Policy Design Principles

- ❑ Effectiveness
- ❑ Cost-effectiveness
- ❑ Equitable impacts
- ❑ Cost containment
- ❑ Near-term deployment of clean technology
- ❑ Long-term technology advancement

For More Information

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Visit the Pew Center's CES Webpage:
<http://bit.ly/PewCES>

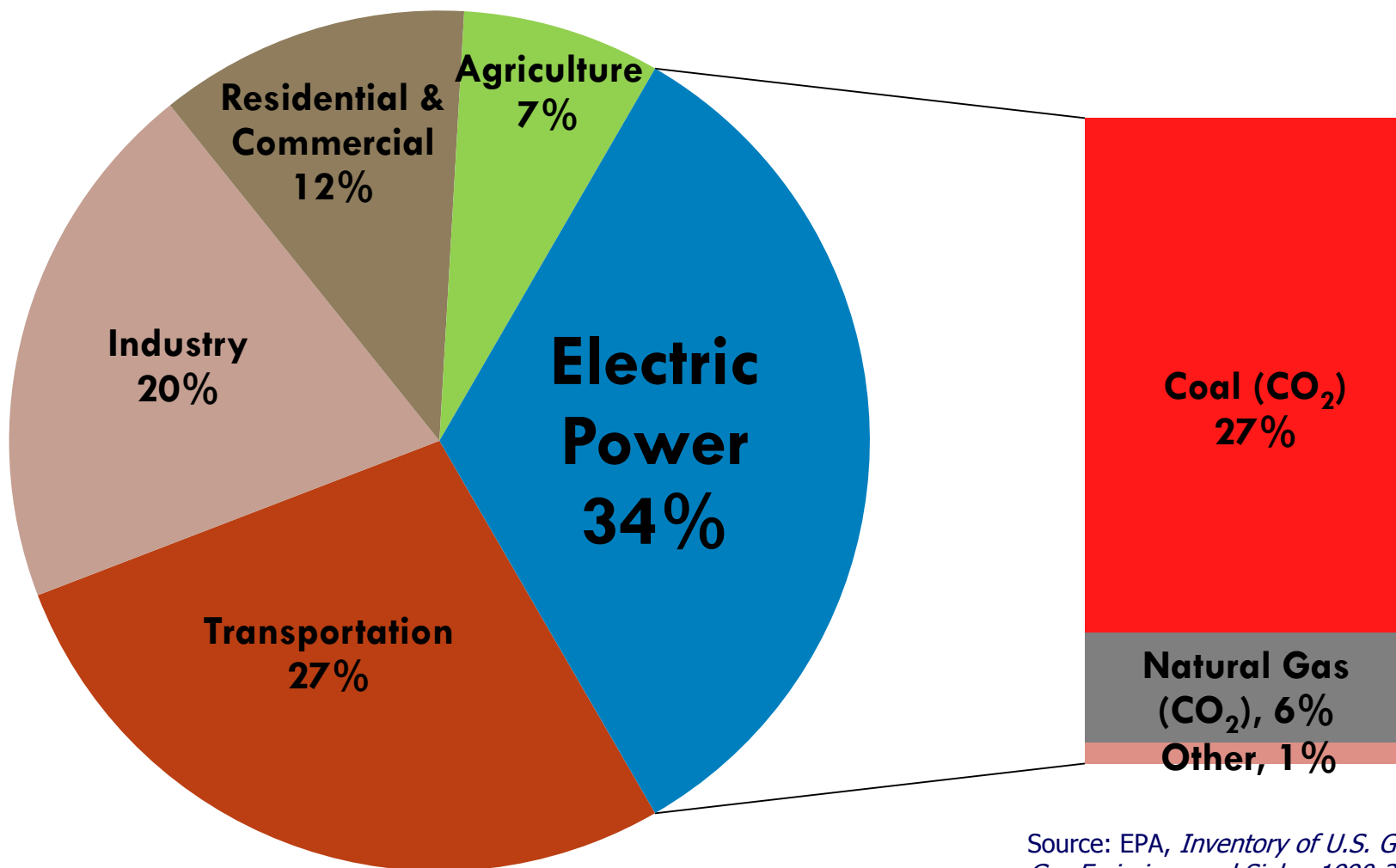
Backup Slides



Electricity and Climate Change

10

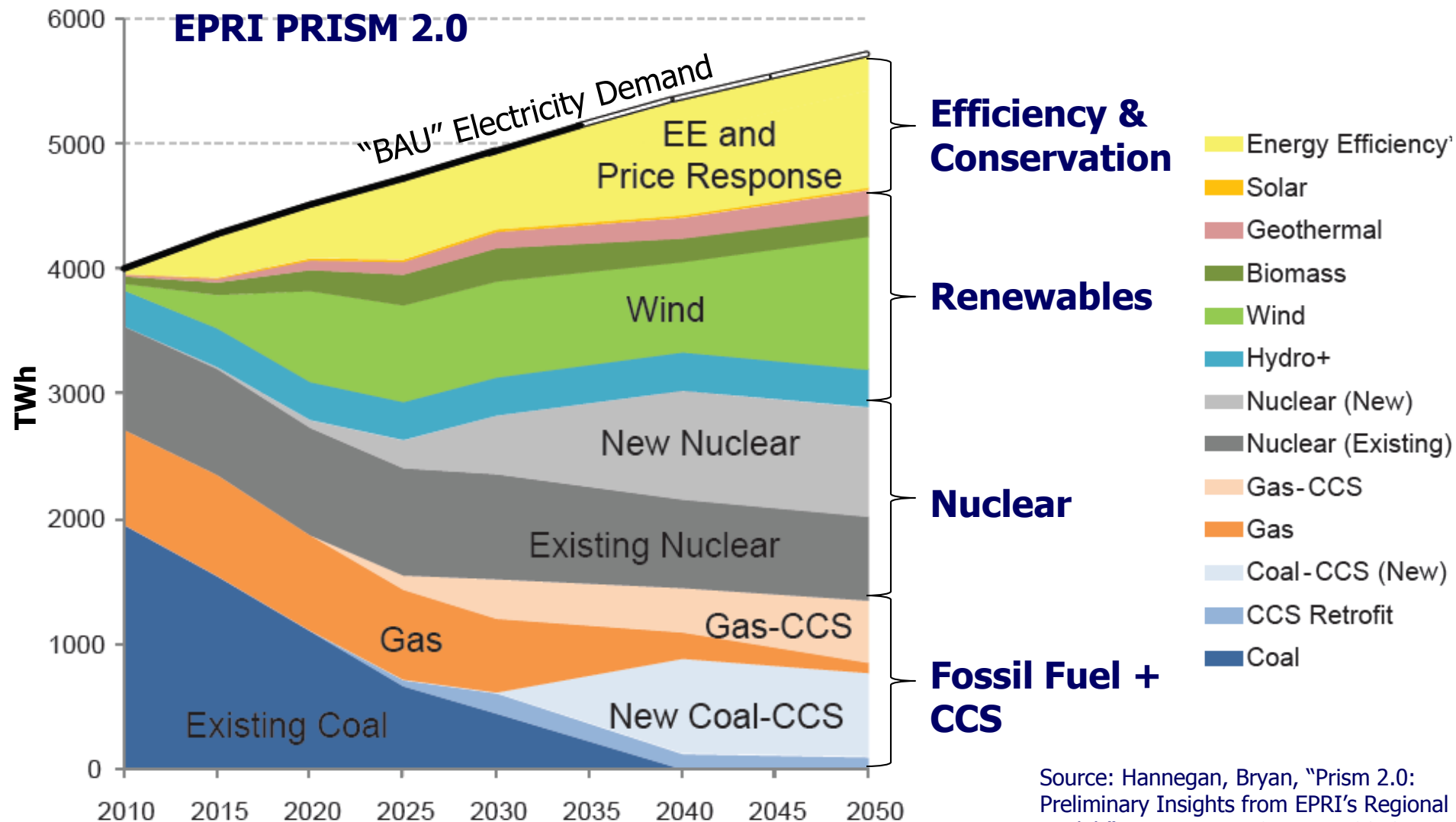
U.S. Greenhouse Gas Emissions by Sector, 2009



Source: EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009*

Clean Power Technologies

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Source: Hannegan, Bryan, "Prism 2.0: Preliminary Insights from EPRI's Regional Model," Presentation, 2 August 2010.

Clean Power Policies

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Type

Examples

R&D

- ARPA-E
- Energy Innovation Hubs

**Demos /
First
Movers**

- FutureGen 2.0
- Loan Guarantee Program

**Deploy-
ment**

- Production/Investment Tax Credit
- **Clean Energy Standard (CES)**



Clean Energy Standard (CES)

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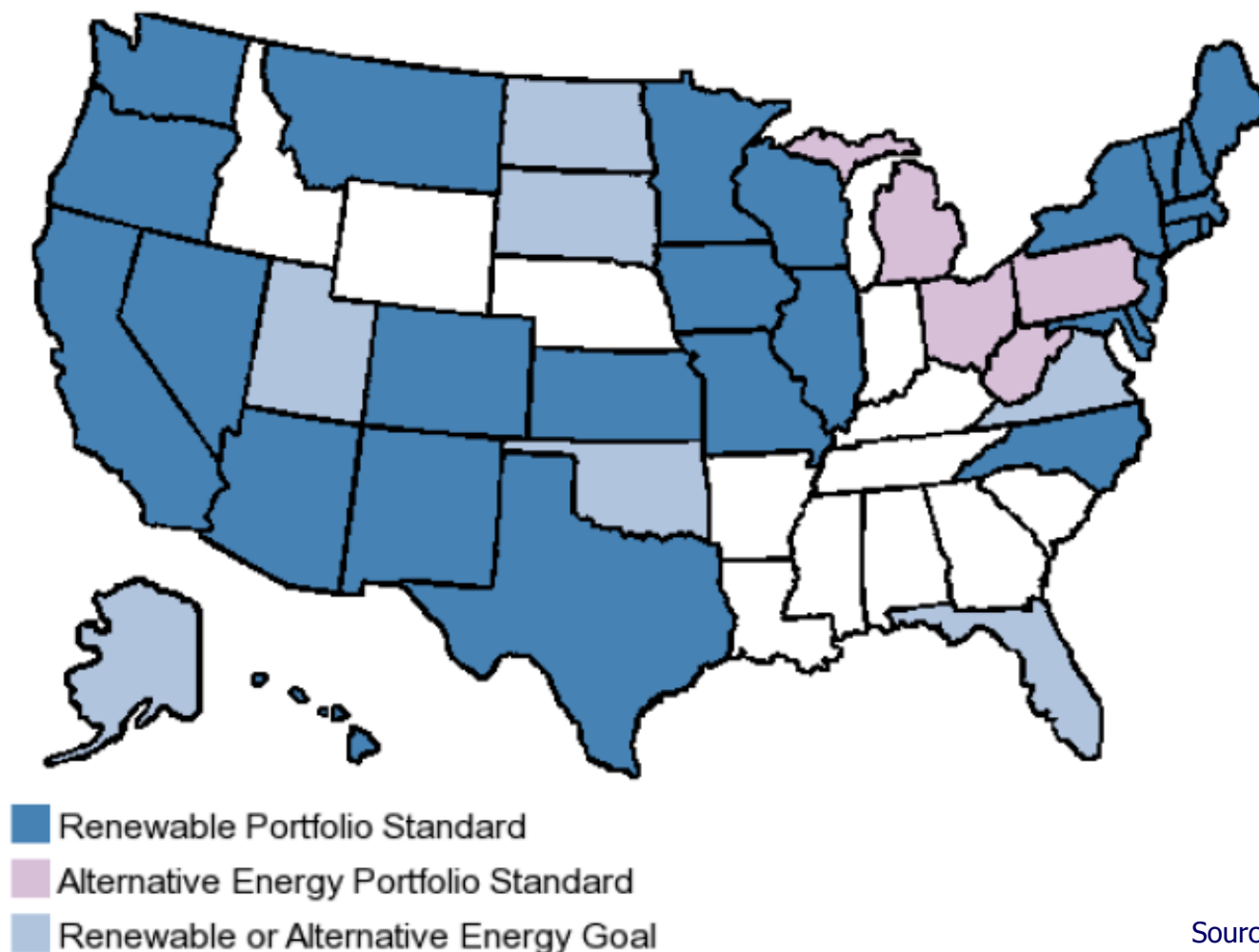
- Requires **an increasing share** of electricity to come from clean energy
- Sends a **price signal** to cost-effectively spur deployment of clean energy technologies
- Allows for **compliance flexibility**, e.g.,
 - Credit trading
 - Multiple clean energy options



State Policy Innovation

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30 states plus DC have renewable or alternative energy portfolio standards



Bipartisan Interest in CES

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- 2011
 - ▣ President Obama's CES Proposal
 - ▣ Senators Bingaman and Murkowski CES White Paper
- 2009-2010
 - ▣ Senator Lugar's Diverse Energy Standard (S.3464)
 - ▣ Senator Graham's Clean Energy Standard (S.20)
- Past renewable electricity standard bills have provisions relevant to a more broadly defined CES (e.g., 2009 Senate energy bill, S.1462)